Trend Study 18-10-97

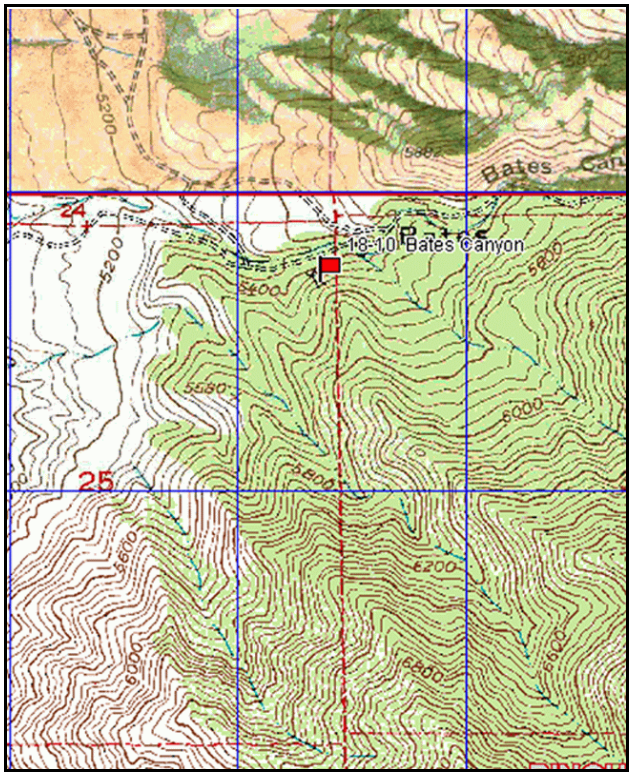
Study site name: Bates Canyon . Vegetation type: Big Sagebrush .

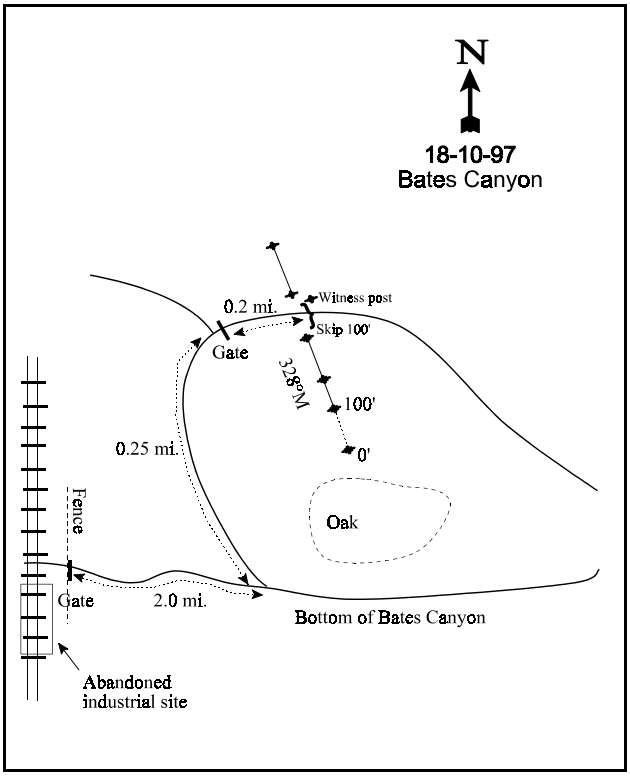
Compass bearing: frequency baseline 328 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Highway U-36 just north of Erda, turn east on the road marked by the "Bates Canyon" sign. Proceed east on this road for 1.40 miles to a fence near an abandoned industrial plant. Proceed east through the gate for approximately 2.0 miles up Bates Canyon to a fork. Turn left (north) and travel approximately 0.50 miles to where there is a green steel fencepost 15 inches in height, on the right (south) side of the road. This is nearly to the point where the road turns downhill into Bates Canyon again. From this point, the 0-foot mark of the frequency baseline is 29 paces away at an azimuth of 213 degrees magnetic. The 0-foot mark is marked by a green steel fencepost with a red browse tag, number 3916 attached.





Map Name: Bingham Canyon

Diagrammatic Sketch

Township 2S , Range 4W , Section 25

GPS: NAD 27, UTM 12S 4497537 N 395250 E

DISCUSSION

Bates Canyon - Trend Study No. 18-10

***SUSPENDED - This site was suspended in 2002. Text and tables from the 1997 report have been retained and are found below.

The Bates Canyon study is located within a nearly pure mountain big sagebrush community on a 10-15% west facing bench at the mouth of Bates Canyon. The area is deer winter range and potentially elk winter range. In the past is was grazed by sheep but the site is now permitted for cattle use with 250 AUM's split between the spring and fall. Elevation of the site is 5,200 feet. It was noted in 1983 that the sagebrush population was apparently a stand that had become established after a fire for there were numerous burned sagebrush stems.

Soil is brown in color and alluvially deposited. Soil textural analysis indicates it to be a clay loam with a slightly acidic pH (6.4). Effective soil depth is almost 15 inches with a soil temperature of 53°F at 17 inches. Rock cover, which makes up about 12% cover, is mostly (86%) pavement. Most of the soil surface not directly under a sagebrush crown is erosion pavement or bare soil. Herbaceous cover was initially very sparse in 1983, but with the combination of pavement, gentle slope, and comparatively low precipitation, there is a relatively low rate of erosion.

Browse composition consists mostly of low growing (e.g. about 15 inches) mountain big sagebrush with an occasional interspersed broom snakeweed. Species identification of the sagebrush ecotype is difficult. In growth habit, it resembles Wyoming big sagebrush. Although, morphological characteristics and ultraviolet light testing suggest it to be mountain big sagebrush. Shrub density is moderate and individuals tend to be evenly spaced. Shrub interspaces initially (1983) were nearly barren of vegetation. Utilization was mostly moderate, yet vigor was good and numerous young and decadent plants were indicative of a dynamic but essentially stable and self-sustaining population. In 1989, the sagebrush population remained at a stable density yet increased in percent decadence from 15% to 57%. Poor vigor was also noted on 24% of the plants sampled. In 1997, density of sagebrush increased to 14,280 plants/acre. The sample size was greatly increased which gives a much better estimate of sagebrush density. This is evident with the relatively low density estimates given in 1983 and 1989 of 3,899 and 3,032 plants/acre respectively. Currently, percent decadency has decreased to only 12% and those with poor vigor are down to 9% from a high of 24% in 1989. The health of the sagebrush community appears to be improving.

Both grasses and forbs were relatively rare in 1983 and were discounted as forage sources or as an important soil protection. By far the most commonly occurring species were the annual grasses. Perennial grasses were limited to Sandberg bluegrass and bulbous bluegrass. Except for an abundance of bur buttercup and isolated individuals of foothill deathcamas, mountain dandelion, and sego lily, forbs are nearly missing from the site in 1983. Sum of nested frequency has increased substantially since then for grasses and forbs. However, composition is poor. Bulbous bluegrass currently makes up 88% of the grass cover and weedy annual and perennial forbs dominate the forb component. The forbs are still a minor component of the herbaceous understory, but the number of species occurring on the site have increase significantly, from 3 to 11 to 23 in 1997.

1983 APPARENT TREND ASSESSMENT

Soil trend appears to be stable to slightly declining. Although most of the ground surface is barren, only moderate soil loss appears to be occurring. The gentle slope and pavement cover allows only slight erosion. Vegetatively, the area appears quite stable. The big sagebrush population is obviously self sustaining and the barren interspaces virtually rule out the possibility of fire.

1989 TREND ASSESSMENT

The trend for soils was assessed as improving because of a significant decrease in percent bare soil (21% to 3%), a large increase in cryptogamic cover (6% to 24%), and an increase in herbaceous cover. The 1989 report declared that the mountain big sagebrush was stable to possibly increasing. The data supports the opposite view where its density decreased by 22%, percent decadence increased from 15% to 57%, with 42% of the decadent plants being classified as having poor vigor or dying. Those individuals with poor vigor increased from 10% to 24%. This all points to a sagebrush community that is experiencing a downward trend due to combination of factors including extended drought, intraspecific competition, and moderate use. This will cause some thinning of the population. The trend for the herbaceous understory is up, with increases in species diversity and abundance. But, much of the herbaceous species are classified as weedy increaser species.

TREND ASSESSMENT
soil - up (5)
browse - down (1)
herbaceous understory - up, but is dominated by weedy species (5)

1997 TREND ASSESSMENT

The trend for soils appears to be stable with percent bare soil stable at 3% and slight increases in herbaceous species abundance. The trend for sagebrush is improved with a decline in percent decadence. However, 74% of the decadent plants were classified as dying in 1997. Young plants are abundant (5,100 plants/acre) and appear adequate to replace the individuals that may be lost in the future. The percentage of plants classified as having moderate to heavy use increased to over 60%. The density for the sagebrush is still probably too high for the site at 14,280 plants/acre. Depending on the extent of the drought periods, this population could experience further losses. Nevertheless, this will not be able to be determined until the next sampling date in 2002. The trend for the herbaceous understory is slightly up with increases for perennial grass and forb species. The number of grass species have not changed much through the years, but for the forbs it has changed dramatically (3 in 1983, 11 in 1989, and 23 in 1997). However, the grasses still make up almost 80% of the herbaceous cover, making forbs still a minor component of the herbaceous understory. One species, bulbous bluegrass, contributes 70% of the total herbaceous cover. One can follow the dramatic increase it has experienced since 1983 by the inspection of its sum of nested frequency values; 12 in 1983, 251 in 1989, and 309 in 1997. The herbaceous understory has improved, but it still is dominated by "weedy" increaser species.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - up slightly, but is dominated by weedy species (4)

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 10

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	'97
G	Bromus japonicus (a)	-	-	16	-	-	7	.03
G	Bromus tectorum (a)	-	-	77	-	-	30	.20
G	Poa bulbosa	a12	b251	c309	6	82	87	14.98
G	Poa fendleriana	a-	b19	a4	-	8	1	.38
G	Poa secunda	b84	a23	b57	30	9	22	1.41

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	'97
Total for Annual Grasses		0	0	93	0	0	37	0.24
Total for Perennial Grasses		96	293	370	36	99	110	16.78
Total for Grasses		96	293	463	36	99	147	17.02
F	Agoseris glauca	$_{ab}$6	$_{a}$-	$_{b}$14	3	-	7	.04
F	Ambrosia psilostachya	$_{a}$-	$_{a}$-	$_{b}$23	-	-	9	.32
F	Arabis spp.	-	3	3	-	1	1	.00
F	Asclepias asperula	-	1	-	-	1	-	-
F	Astragalus utahensis	-	-	6	-	-	3	.21
F	Castilleja chromosa	$_{a}$-	$_{b}$25	$_{b}$35	-	12	18	.27
F	Caulanthus crassicaulis	$_{a}$-	$_{a}$-	$_{b}$10	-	-	5	.07
F	Calochortus nuttallii	$_{a}$2	$_{ab}$11	$_{b}$18	1	6	10	.05
F	Collomia linearis (a)	-	-	32	-	-	13	.09
F	Collinsia parviflora (a)	-	-	5	-	-	2	.01
F	Descurainia spp. (a)	-	-	4	-	-	1	.00
F	Draba spp. (a)	-	-	75	-	-	27	.16
F	Epilobium brachycarpum (a)	-	-	199	-	-	79	.49
F	Galium aparine (a)	-	-	1	-	-	1	.00
F	Grindelia squarrosa	$_{a}$-	$_{b}$5	$_{c}$86	-	4	32	1.82
F	Helianthus annuus (a)	-	66	-	-	31	-	-
F	Heterotheca villosa	-	-	-	-	-	-	.00
F	Holosteum umbellatum (a)	-	-	30	-	-	11	.10
F	Lactuca serriola	$_{a}$-	$_{b}$22	$_{a}$-	-	10	-	-
F	Lesquerella spp.	-	5	-	-	2	-	-
F	Lomatium triternatum	$_{a}$-	$_{b}$13	$_{a}$2	-	5	1	.00
F	Microsteris gracilis (a)	-	-	1	-	-	1	.00
F	Phlox hoodii	-	-	2	-	-	1	.03
F	Polygonum douglasii (a)	-	-	25	-	-	9	.04
F	Tragopogon dubius	$_{a}$-	$_{a}$-	$_{b}$98	-	-	46	.41
F	Unknown forb-perennial	$_{a}$-	$_{b}$76	$_{a}$-	-	36	-	-
F	Viola spp.	-	1	1	-	1	1	.00
F	Wyethia amplexicaulis	-	-	3	-	-	1	.03
F	Zigadenus paniculatus	$_{a}$21	$_{b}$88	$_{a}$46	11	43	23	.20
Total for Annual Forbs		0	66	372	0	31	144	0.92
Total for Perennial Forbs		29	250	347	15	121	158	3.49
Total for Forbs		29	316	719	15	152	302	4.41

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 18 , Study no: 10

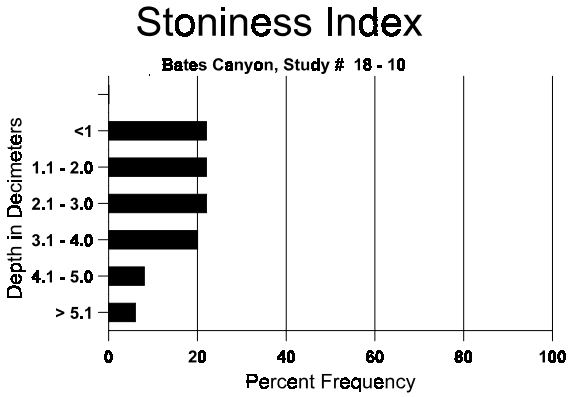
Type	Species	Strip Frequency '97	Average Cover % '97
B	Artemisia tridentata vaseyana	97	19.03
B	Gutierrezia sarothrae	44	.99
B	Quercus gambelii	2	-
Total for Browse		143	20.03

BASIC COVER --
Herd unit 18 , Study no: 10

Cover Type	Nested Frequency '97	Average Cover % '83	'89	'97
Vegetation	368	.50	6.50	42.57
Rock	153	1.25	1.00	1.74
Pavement	268	25.50	26.50	10.59
Litter	394	46.00	39.50	36.64
Cryptogams	265	6.00	23.75	16.48
Bare Ground	180	20.75	2.75	3.25

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 10, Bates Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.6	53.0 (17.0)	6.4	29.6	31.8	38.6	2.5	17.0	268.8	.3



PELLET GROUP FREQUENCY --
Herd unit 18 , Study no: 10

Type	Quadrat Frequency '97
Rabbit	1
Deer	13
Cattle	1

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 10

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	188	-	-	-	-	-	131	-	-	319	-	-	-	10633			319
	97	42	-	-	1	-	-	-	-	-	43	-	-	-	860			43
Y	83	22	2	-	-	-	-	-	-	-	24	-	-	-	800			24
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	53	-	100	1	-	100	-	-	-	254	-	-	-	5100			255
M	83	22	48	6	-	-	-	-	-	-	73	-	3	-	2533	15	33	76
	89	25	10	2	-	-	-	-	-	-	35	2	-	-	1233	11	22	37
	97	164	179	27	-	-	-	-	-	-	270	100	-	-	7420	16	31	371
D	83	1	8	8	-	-	-	-	-	-	8	-	9	-	566			17
	89	39	13	-	-	-	-	-	-	-	29	1	14	8	1733			52
	97	27	59	2	-	-	-	-	-	-	23	-	-	65	1760			88
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	1560			78

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	50%	12%	10%	-22%
'89	25%	02%	24%	+79%
'97	33%	32%	09%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	3899	Dec:		15%
'89	3032			57%
'97	14280			12%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	83	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	50	-	-	-	-	-	-	-	-	50	-	-	-	1000			50
Y	83	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	89	21	-	-	-	-	-	-	-	-	21	-	-	-	700			21
	97	67	-	-	-	-	-	-	-	-	67	-	-	-	1340			67
M	83	3	-	-	-	-	-	-	-	-	3	-	-	-	100	12	14	3
	89	15	-	-	-	-	-	-	-	-	15	-	-	-	500	8	8	15
	97	130	-	-	-	-	-	-	-	-	130	-	-	-	2600	7	7	130
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	8	2	-	-	-	-	-	-	-	5	-	-	5	333			10
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+83%
'89	04%	00%	11%	+61%
'97	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	266	Dec:	0%
	'89	1533		22%
	'97	3940		0%

Quercus gambelii																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	20	21	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	40		-